TEN YEARS AFTER THE GREAT RECESSION: ARE YOUNG ADULTS BETTER ABLE TO NAVIGATE STUDENT LOANS?

by
Brendan Griffiths

A capstone submitted to Johns Hopkins University in conformity with the requirements for the degree of Master of Science in Government Analytics

Baltimore, Maryland
December 2018

© 2018 Brendan Griffiths
All Rights Reserved

Abstract

Previous research has extensively studied the relationship between basic financial knowledge and decision making. Within this framework, scholars have reached mixed conclusions on whether those with formal training are best suited to handle their finances. This article examines the association further by analyzing the behavior of those who reached adulthood after the Great Recession as it relates to student debt. Using a difference in means and multivariate analysis among a random sample of over 27,000 individuals, it appears that today's young adults are more inclined to use loans to finance their education while also demonstrating more responsible behaviors associated with student debt. Controlling for age, financial knowledge and confidence are both linked to a lower likelihood of being in debt. These findings suggest that policymakers should address financial literacy as part of the solution to growing outstanding student debt amounts.

Table of Contents

1. Introduction

Despite the recent momentum from progressive politicians to make higher education more affordable, the fact remains that many American students require federally subsidized and private loans to pay for college. For plenty of young adults, the amount of debt necessary to graduate with a degree can be significant and may take many years to pay off in full. According to the latest quarterly report from the Federal Reserve Bank of New York on household debt and credit, the entire amount of outstanding student loans in the United States surpassed $1.4 trillion. This represents slightly more than ten percent of all outstanding consumer debt.[1] Further illuminating how much student debt has grown, the Institute for College Access and Success reported that in 2011 nearly two-thirds of those ready to graduate college had loans adding to $26,600 on average.[2] Although the vast majority beginning their freshman year of college have reached legal adulthood before stepping on campus, and are thus legally responsible for the debt they incur, college students often lack the understanding or confidence to make mature financial decisions.

As such, current scholarship raises questions about whether American students would stand to benefit from additional financial education. Researchers have repeatedly found that young adults are not particularly knowledgeable about basic financial concepts and feel inadequately prepared to navigate important financial milestones such as paying

1. Federal Reserve Bank of New York. 2018. Quarterly Report on Household Debt and Credit, 2018 : Q3. https://www.newyorkfed.org/medialibrary/interactives/householdcredit/data/pdf/HHDC_2018Q3.pdf.

2. Reed, Matthew and Debbie Cochrane. 2012. "Student Debt and the Class of 2011." Project on Student Debt. https://ticas.org/sites/default/files/pub_files/classof2011.pdf.

for a degree, buying a car, or purchasing a home.[3] This study will examine financial literacy from two approaches—the objective knowledge of survey respondents to questions related to basic financial concepts and subjective knowledge, or the judgment of one's own personal finance skills. Notwithstanding some evidence that financial education is associated with increased financial literacy,[4] coursework meant to boost knowledge and confidence among students entering college has mixed effects on the resulting financial behaviors of young adults.[5] Much of the literature on financial literacy and decision-making centers on individuals who achieved adulthood more than a decade ago.

Beginning in 2008, the world economy suffered a severe economic downturn. During the height of the Great Recession, American unemployment reached its highest point in nearly 30 years with one in ten labor force participants out of work.[6] The Recession had a much greater impact on the unemployment rate for college-aged adults thereby increasing the wage gap between the young and old.[7] Sometimes jobless and oftentimes forced to live with their parents well into adulthood, the Millennial generation has a greater awareness of how a sluggish economy impacts livelihood. This paper focuses on the generational effects of those who achieved adulthood during the Great

3. Lusardi, Anna-Maria, Olivia S. Mitchell, and Vilsa Curto. 2010. "Financial Literacy among the Young." Journal of Consumer Affairs 44 (2): 358-380; Xiao, Jing Jian, Sun Young Ahn, Joyce Serido, and Soyeon Shim. 2014. "Earlier Financial Literacy and Later Financial Behaviour of College Students." International Journal of Consumer Studies 38 (6): 593-601.

4. Danes, Sharon M., Catherine Huddleston-Casas, and Laurie Boyce. 1999. "Financial Planning Curriculum for Teens: Impact Evaluation." Journal of Financial Counseling and Planning 10 (1): 26-39.

5. Mandell, Lewis. 2006. "Financial Literacy: If it's so Important, Why Isn't it Improving?" Networks Financial Institute Policy Brief 2006-PB-08: 1-10.

6. U.S. Bureau of Labor Statistics, "Civilian Unemployment Rate [UNRATE]," last modified December 7, 2018; https://fred.stlouisfed.org/series/UNRATE.

7. Bell, David NF, and David G. Blanchflower. "Young people and the Great Recession." Oxford Review of Economic Policy 27, no. 2 (2011): 241-267.

Recession as it relates to their financial decision-making ability. Student loans are the main driver of this research since it represents one of the first major financial decisions that youth encounter in their lifetime.

Based on the most recent data from the Financial Industry Regulatory Authority's (FINRA) National Financial Capability Study (NFCS), many surveyed do not have a strong grasp of the basic concepts of personal finance. Furthermore, despite experiencing firsthand the hardship of the worst period of economic upheaval since the Great Depression, young Millennials are more likely to accumulate student loan debt than generations of recent college graduates before them. Additionally, the FINRA data indicate that even for those with high financial knowledge and high financial confidence have student loan debt. This paper, however, will argue that even though the amount of student debt is rising across the board, young adults are better equipped to manage their loans than generations before them. Based on several survey measures, knowledge and confidence had some positive effects on whether individuals had a plan to tackle student debt, whether they were concerned about the amount of their loan balance, and whether a payment was ever missed. These positive effects were also true for the most recent cohort of students to enter and graduate college.

2. Literature Review

The literature on the topic of young adult decisions about student loan debt has focused thus far on three research areas: youth financial literacy, debt literacy, and policy as it relates to personal finance education. There has been a significant amount of discussion concerning the amount of knowledge high school and college students possess

to make important financial decisions. The results are sobering. Fewer than one-third of young adults possess basic knowledge of interest rates, inflation and risk diversification.[8] What is also concerning is that Lusardi et al. observed that financial literacy is disproportionate across demographics, education level, and upbringing. This indicates that there may be a degree of systemic bias against disadvantaged groups when it comes to personal finance education. The study found that males were more likely than females to understand rudimentary personal finance concepts. The knowledge gap was also present between those who were college-educated versus those who were not and between individuals whose parents invested in stocks or had retirement accounts and individuals who came from families with little savings. Chen and Volpe were also able to show that certain characteristics of students increased the likelihood of wrong financial opinions and poor money management.[9] Their study demonstrated that business majors, those who came from higher class ranks, and individuals with more work experience tend to have greater financial literacy.

The fraction of students without adequate knowledge of simple money management concepts may have disastrous consequences—both for their own financial futures and for the rest of society. If large student loan debt loads are necessary to make higher education possible, it may mean that an individual will delay other purchases that are typically financed through debt such as a car or home. This impacts the potential for economic growth. Further, significant debt might make it harder to save money for emergencies or for retirement. Unsurprisingly, many adults also have low levels of debt

8. Lusardi, Anna-Maria, Olivia S. Mitchell, and Vilsa Curto. "Financial Literacy among the Young."
9. Chen, Haiyang and Ronald P. Volpe. 1998. "An Analysis of Personal Financial Literacy among College Students." Financial Services Review 7 (2): 107-128.

literacy.[10] Lusardi and Tufano discovered that only one-third of respondents in their survey could apply concepts of compound interest to everyday situations or understand the workings of credit cards. Previous work by Huston substantiates the finding that debt illiteracy leads to financial harm.[11] In the Huston study, low levels of financial competence tended to result in higher borrowing costs for those with credit card and mortgage debt. Despite the need to use debt to pay for a house or education, many feel ill-equipped to make important financial decisions. This clearly can negatively impact an individual's confidence about money management. Lusardi and Tufano also learned through their work that those who scored low on objective measures of financial knowledge judged that their debt position was excessive and challenging to overcome.

Not only do the indebted feel overwhelmed due to their lack of comfort navigating important financial decisions, studies have shown that low scores on financial literacy tests impact the future financial behavior of college students.[12] Xiao et al. made an important discovery that fiscal responsibility of young adults differed by subjective and objective knowledge. Subjective knowledge, or the judgment of one's own financial literacy, was associated with better future credit card habits as it relates to risky borrowing and paying behaviors than objective factors, or the ability to answer questions about money correctly. This demonstrates that it is not simply enough to teach students how to manage debt responsibly, but young people must also feel comfortable in their ability to handle money. The idea that financial knowledge does not necessarily lead to

10. Lusardi, Annamaria and Peter Tufano. 2015. "Debt Literacy, Financial Experiences, and Overindebtedness." Journal of Pension Economics and Finance 14 (4): 332-368.

11. Huston, Sandra J. 2012. "Financial Literacy and the Cost of Borrowing." International Journal of Consumer Studies 36 (5): 566-572.

12. Xiao, Jing Jian, Sun Young Ahn, Joyce Serido, and Soyeon Shim. "Earlier Financial Literacy and Later Financial Behaviour of College Students."

financial security was replicated in other studies as well. Robb and Sharpe's paper on the effect of financial knowledge on credit card debt found that among those with credit card balances, the amount of debt an individual carried was not linked to the level of expertise he or she had about personal finance.[13]

Given the low scores among the nation's youth, many state and local policy makers are wondering if financial literacy should be granted higher priority in secondary and post-secondary educational curricula. There have been several studies that dive deeper into the link between education and personal finance; however, the results are varied. A study from the late 1990s explored the value of financial planning courses for high schoolers, and the findings were positive.[14] Danes et al. found that students experienced higher levels of financial knowledge, behavior, and self-efficacy both immediately after studying the curriculum and three months after completion. Additional studies bolster the theory on the positive returns of high school personal finance education. Among states that make financial coursework a requirement, students who lived in those areas during high school experience higher levels of exposure to important money management concepts.[15] According to Bernheim et al., states over the past several decades have implemented programs to increase awareness of personal finance concepts in secondary school to equip students with practical decision-making skills that would prove useful in their adult lives. Exposure in their study was measured by asking survey respondents whether they participated in mandatory financial education during their

13. Robb, Cliff A. and Deanna L. Sharpe. 2009. "Effect of Personal Financial Knowledge on College Students' Credit Card Behavior." Journal of Financial Counseling and Planning 20 (1): 25-43.

14. Danes, Sharon M., Catherine Huddleston-Casas, and Laurie Boyce. "Financial Planning Curriculum for Teens: Impact Evaluation."

15. Bernheim, B. D., Daniel M. Garrett, and Dean M. Maki. 2001. "Education and Saving: The Long-Term Effects of High School Financial Curriculum Mandates." Journal of Public Economics 80 (3): 435-465.

schooling. The results show that those with higher exposure accumulated more wealth in their lifetimes than those who were not required to complete finance coursework.

However, not all studies have reached the same conclusions as Danes and Bernheim. Mandell, in a study from 2006, learned by tracking secondary school students five years after taking a class in finance that the instruction had no positive impact on financial literacy or attitude towards thrift.[16] Although most states require some coursework in personal finance, Mandell's research suggests that high school may not be an appropriate stage to impart fiscal responsibility to young adults to reap short-term gains in literacy. Comparing high-school to college personal finance curricula, it appears that college courses tend to have a more profound impact on financial knowledge.[17] This may be due to college students more frequently interacting with the financial system because of greater autonomy. Since some must pay expenses like rent and utilities on their own, financial planning concepts are likely made more real for those in college than those in high school.

The existing literature does raise several questions about timing and the value of personal finance education as it relates to student debt. The following sections will discuss the impact of financial literacy on college loans and evaluate whether this has changed demonstrably since the Great Recession. The paper will also dive deeper into whether developing a better grasp of financial planning concepts is a powerful strategy to combat rising student indebtedness.

16. Mandell, Lewis. "Financial Literacy: If it's so Important, Why Isn't it Improving?"

17. Peng, Tzu-Chin Martina, Suzanne Bartholomae, Jonathan J. Fox, and Garrett Cravener. 2007. "The Impact of Personal Finance Education Delivered in High School and College Courses." Journal of Family & Economic Issues 28 (2): 265-284.

3. Data and Methods

FINRA, in conjunction with the federal government, non-profit organizations, and academics, administers the NFCS every three years to gauge the financial well-being of American adults.[18] FINRA acknowledges that there are many ways to measure personal financial health, yet it designs its survey instrument to evaluate a combination of skills, judgment and resources that inform financial decisions.[19] The survey is fielded to nearly 500 adults in each state and the District of Columbia with the exception of four states which contain large population centers. These locations each include 1,000 respondents to allow researchers to study the financial strength of those living in different municipalities. The NFCS survey has been administered in waves from 2009, 2012, and 2015. The bulk of the analysis for this paper involves data from the most recent NFCS wave where there are additional questions related to student loan debt than in previous waves. The survey questions home in on four key areas that capture financial knowledge and behavior. The focus areas include the ability of respondents to make ends meet, to plan ahead, and to manage financial products responsibly and the level of financial acumen an individual possesses. The total number of records in the 2012 survey is 25,509 and the 2015 total is 27,564. To ensure that state and population demographics are proportional to national averages, the NFCS survey data is weighted.

Data analysis in this study uses paired t-tests to measure differences in mean financial literacy scores among demographic groups. Further, a set multivariate logit

18. Financial Industry Regulatory Authority. 2016. Financial Capability in the United States 2016. http://www.usfinancialcapability.org/downloads/NFCS_2015_Report_Natl_Findings.pdf.

19. Mottola, Gary R. and Christine N. Kieffer. 2017. "Understanding and using Data from the National Financial Capability Study." Family and Consumer Sciences Research Journal 46 (1): 31-39.

models provides insight into the marginal likelihood of acquiring student loan debt. The logit models in this paper follow the guidelines outlined by Stock and Watson:[20]

$$\Pr(Y = 1|X_1, X_2, \dots, X_k) = F(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_k X_k)$$

The beta coefficients from the Stock and Watson logit model represent the logarithm of the odds given a one unit increase in X. Odds ratios were calculated to determine the increase in probability of having student loans:[21]

$$e^{\beta} = e^{\left[\log\left(\frac{odds_p}{odds_q}\right)\right]} = \frac{odds_p}{odds_q} = odds\ ratio$$

The logit models throughout this paper are comprised of several demographic control variables in addition to variables which measure financial education and financial literacy. Additional sets of logit models are used to measure the marginal likelihood of being concerned about one's student loan debt, having a plan to pay off one's debt, and making a late payment on one's debt.

To run the difference in means tests and build the multivariate models, dummy variables are created for the following demographic characteristics: gender, age, race, educational attainment, marital status, income, and employment status. The variable for age is treated somewhat differently than the other demographic variables. Since the analysis in this study measures the generational effects of growing up during the Great Recession, a dummy variable is created to differentiate the 18-24-year-old group from the rest of the survey respondents. The youngest group in the 2015 wave ranged in age from 11-17-years-old during the height of the recession in 2008. In addition, dummies are used

20. Stock, James H. and Mark W. Watson. 2007. Introduction to Econometrics. Addison-Wesley Series in Economics. Boston: Pearson/Addison Wesley.

21. Bruin, J. 2006. "How do I interpret odds ratios in logistic regression?" UCLA: Statistical Consulting Group. https://stats.idre.ucla.edu/stata/faq/how-do-i-interpret-odds-ratios-in-logistic-regression/.

to code variables related to student loan debt and financial education. Next, objective financial literacy scores are obtained from the number of correct responses to the questions in Table 1.

TABLE 1. *Objective Financial Literacy Questions in the 2015 National Financial Capability Study*

Survey Item #	Measure	Possible Responses	Correct Response
M6	Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?	1. More than $102 2. Exactly $102 3. Less than $102 4. Don't know 5. Prefer not to say	1. More than $102
M7	Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?	1. More than today 2. Exactly the same 3. Less than today 4. Don't know 5. Prefer not to say	3. Less than today
M8	If interest rates rise, what will typically happen to bond prices?	1. They will rise 2. They will fall 3. They will stay the same 4. There is no relationship between bond prices and the interest rate 5. Don't know 6. Prefer not to say	2. They will fall
M31	Suppose you owe $1,000 on a loan and the interest rate you are charged is 20% per year compounded annually. If you didn't pay anything off, at this interest rate, how many years would it take for the amount you owe to double?	1. Less than 2 years 2. At least 2 years but less than 5 years 3. At least 5 years but less than 10 years 4. At least 10 years 5. Don't know 6. Prefer not to say	2. At least 2 years but less than 5 years
M9	A 15-year mortgage typically requires higher monthly payments than a 30-year mortgage, but the total interest paid over the life of the loan will be less.	1. True 2. False 3. Don't know 4. Prefer not to say	1. True
M10	Buying a single company's stock usually provides a safer return than a stock mutual fund.	1. True 2. False 3. Don't know 4. Prefer not to say	2. False

A dummy variable is created to measure whether a respondent answered more than half of the questions in survey correctly. Finally, subjective literacy scores are determined based on how those surveyed responded to the following question: "On a scale from 1 to 7, where 1 means very low and 7 means very high, how would you assess your overall financial knowledge?" The dummy for subjective financial differentiates those who possess high subjective financial literacy—which indicates a selection greater than 4—and those who do not.

4. Results and Analysis

4.1 Descriptive Findings

Overall, the results of the FINRA NFCS survey paint a somewhat bleak picture of financial literacy. Both objective (i.e., the number of correct answers to six survey questions measuring personal finance knowledge) and subjective (i.e., a self-assessment of financial knowledge on a seven-point scale) scores do not demonstrate high levels of financial knowledge. The average objective financial literacy score is 3.16 out of 6. The average subjective literacy score, on the other hand, is slightly higher at 5.24 on a seven-point scale. While overall scores are low, there are notable differences between groups of respondents as displayed in Table 2.

The results of the analysis in Table 2 tell an interesting story of who is financially literate and who is not. There are significant differences in average scores in objective and subjective measures of literacy across numerous demographic groups. As existing

literature has already established, men tend to have more financial knowledge than women and tend to be more confident about their ability to make financial decisions. [22]

TABLE 2. *Differences in Means (#)*

	Objective Financial Literacy Score (6-point scale)	Subjective Financial Literacy Score (7-point scale)
Gender		
Male vs. Female	0.61***	0.26***
Age Group		
Reached adulthood pre-recession vs. not	0.88***	0.35***
Ethnicity		
White vs. non-white	0.63***	0.05**
Education		
College graduate vs. not	1.00***	0.36***
High school graduate vs. not	1.27***	0.61***
Income		
Above U.S. median household income vs. not	0.94***	0.47***
Above poverty line vs. not	0.92***	0.58***
Employment Status		
Employed vs. Unemployed	0.23***	0.19***
Student Loans		
Debt-free vs. has student loan debt	0.42***	0.08***
Financial Education		
Financial education through schooling vs. not	0.53***	0.47***
Financial education through parents vs. not	0.24***	0.39***
N = 27,564		

*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$

This is validated in the NFCS where men score on average 0.6 points higher than women on financial literacy questions.

Further, the calculations in Table 2 demonstrate that ethnicity factors into how individuals scored on objective financial literacy questions. Whites score on average 0.6

22. Lusardi, Anna-Maria, Olivia S. Mitchell, and Vilsa Curto. "Financial Literacy among the Young."

points higher than minority groups. However, the gap is narrower when respondents are asked to judge their own level of knowledge. The difference in means between whites and minorities on subjective financial literacy is less than 0.1 points.

Generally, the differences in means are greater between groups on objective evaluations than on the subjective. There is scant evidence on the cause behind this; however, existing scholarship does support the idea that subjective financial literacy matters more as it relates to prudent financial behavior.[23] Thus, this may support public policy which focuses on building financial confidence for those who do not feel comfortable managing their finances.

Education also comes into play based on comparing those with and without high school and college degrees. Table 2 illustrates that educational attainment does make a significant difference in the level of financial knowledge with college graduates scoring a full point higher than non-college graduates and high school graduates scoring 1.3 points higher than dropouts. Financial confidence levels are also divergent among the educated and non-educated. The mean subjective literacy score is 0.4 points higher for those with college degrees compared to those without degrees. Similarly, high school graduates score 0.6 points better than those who did not graduate.

Taking a deeper dive into education, NFCS respondents were asked about their experience with financial education. Some states require personal finance coursework before graduating high school and some colleges incorporate these types of courses into

23. Xiao, Jing Jian, Sun Young Ahn, Joyce Serido, and Soyeon Shim. "Earlier Financial Literacy and Later Financial Behaviour of College Students."

their core curricula.[24] Scores on financial literacy measures, however, do not show an extraordinary difference between those with and without financial education. Schooling matters more than the lessons taught by parents. Those who take a finance course score 0.5 points higher on objective and subjective financial literacy than those who do not. Parental financial education appears to affect personal judgements more than objective measures. Individuals who were taught by their parents about money score 0.2 points and 0.4 points higher on the literacy questions and self-assessment questions respectively. These findings may support the Mandell claim that finance coursework in high school and college has little to no impact on whether an individual understands basic finance concepts.[25]

Income characteristics among the survey participants exhibit the importance of the amount one earns on financial literacy. Income may be the byproduct of knowledge rather than the determinate, but either the way, the two appear to be linked. According to the FINRA survey results, those who had above the United States' median household income score 0.9 points on average above those who have incomes that are less than the median. The trend carries over to subjective financial literacy as well. High earners assess their financial knowledge 0.5 points higher than low earners.

Likewise, the employed and the unemployed display statistically significant differences in their literacy. Employment is associated with a 0.2-point boost on average to the objective and subjective financial knowledge scores. However, the gain in literacy

24. Peng, Tzu-Chin Martina, Suzanne Bartholomae, Jonathan J. Fox, and Garrett Cravener. "The Impact of Personal Finance Education Delivered in High School and College Courses."

25. Mandell, Lewis. 2006. "Financial Literacy: If it's so Important, Why Isn't it Improving?"

is not as strong as it is across income groups which may indicate that having a job is not as important as earning a high wage as it relates to managing finances.

Finally, student loan holders and those without student debt seem to exhibit different levels of financial competency, yet the differences are not as pronounced as some of the demographic and educational characteristics discussed in the sections above. The debt-free score 0.4 points higher on objective measures and 0.1 points higher on subjective measures. Although some of the literature suggests that subjective literacy matters more when making financial decisions, the difference in means does not underscore previous research. The next section will employ multivariate logit models to explore the effects of literacy on student loan debt more fully.

4.2 Multivariate Analysis

To examine the extent to which financial literacy influences whether an individual will have student loan debt and whether that is different across generations, a multivariate analysis was conducted which is shown in Table 3. As was observed in the difference in means, those with student loan debt tend to have slightly lower objective and subjective financial literacy scores.

In Table 3, an initial logit model examined the demographic characteristics' impact on the probability of having student loan debt. The results show in Model 1 that ethnicity and education have the strongest effect. As explained in the data and methods section, odds ratios were calculated to determine the effect the dependent variables have on the likelihood of being in debt. Those who have graduated college have about a 94% higher probability of having student debt and those who are non-white have around an 88% increased likelihood of being in debt.

TABLE 3. *Multivariate Logit Models: Marginal Effects of Association with Student Loan Debt*

	Model 1	Model 2	Model 3	Model 4	Model 5
Male	-0.235***	-0.264***	-0.279***	-0.228***	-0.273***
	(0.038)	(0.039)	(0.039)	(0.039)	(0.039)
White	-0.631***	-0.543***	-0.527***	-0.478***	-0.528***
	(0.038)	(0.039)	(0.039)	(0.040)	(0.039)
College Graduate	0.660***	0.789***	0.776***	0.869***	0.780***
	(0.040)	(0.041)	(0.041)	(0.043)	(0.042)
Single	0.606***	0.409***	0.409***	0.407***	0.404***
	(0.041)	(0.042)	(0.042)	(0.043)	(0.042)
Employed	0.604***	0.639***	0.645***	0.633***	0.648***
	(0.040)	(0.040)	(0.040)	(0.041)	(0.040)
Income > U.S. Median	-0.397***	-0.337***	-0.349***	-0.300***	-0.341***
	(0.045)	(0.046)	(0.046)	(0.047)	(0.006)
Reached Adulthood after		1.143***	1.128***	1.085***	1.120***
Recession		(0.054)	(0.055)	(0.055)	(0.055)
Financial Education through			0.328***	0.367***	0.339***
Schooling			(0.044)	(0.044)	(0.044)
Financial Education through			-0.138***	-0.129***	-0.126***
Parents			(0.039)	(0.039)	(0.039)
High Objective Financial				-0.434***	
Literacy (Score > 3)				(0.043)	
High Subjective Financial					-0.102**
Literacy (Score > 4)					(0.046)
Pseudo-R^2	0.067	0.092	0.095	0.100	0.095
N	27,564	27,564	27,564	27,564	27,564

*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$

Adding age into the second logit model has a slight impact on the coefficients for the demographic characteristics. However, what is more interesting is that those who reached adulthood after the Great Recession of 2008 (i.e., those aged 18-24 in 2015) have a three times greater chance of dealing with student loans. This provides strong evidence to suggest that the financial hardships that impacted many families during the economic downturn did not deter college-aged students from student loans.

In the third model, financial education is added to the model. Again, the coefficients of the demographic variables hardly move and neither does the one related to

age. Based on the results of Model 3, it appears that financial education through schooling, in fact, has a slight positive relationship with student loan debt. Those who took finance coursework have a 39% greater probability of having debt. On its face, this would suggest that personal finance education is detrimental to a student's financial standing; however, it may suggest that students have a higher comfort level with debt because they have the skills necessary to know how to eventually pay it off. On the other hand, financial education from a person's parents decreases the likelihood of being in debt. Those who missed the opportunity to learn money management from their family were about 15% more likely to have student loans.

The fourth and fifth model include objective and subjective financial literacy scores respectively. In Model 4 objective financial literacy appears to have a greater effect on the likelihood that an individual has student loan debt. Those who demonstrate low levels of financial knowledge are about 54% more likely to incur debt to finance their education. In comparison, subjective financial literacy is added to Model 5 in place of objective financial literacy. The outcome of Model 5 suggests that having low subjective literacy is associated with 11% greater odds of having outstanding student loans. Thus, the results from Models 4 and 5 help bolster the argument that knowledge beats out confidence which, if true, would advise policymakers to place greater emphasis on building financial skills among young adults to stem rising student loan debt amounts.

Although debt may create some barriers on the way to financial independence, it is important to distinguish between those who have their student loan debt under control from those who experience undue hardship because of their debt. Additional multivariate logit models were created to examine the effects of the same independent variables in

Table 3 on a dependent variable related to concern about student loans. Table 4 describes the relationship between these variables.

TABLE 4. *Multivariate Logit Models: Marginal Effects of Association with Having Student Loan Debt Concerns*

	Model 1	Model 2	Model 3	Model 4	Model 5
Male	-0.274***	-0.274***	-0.278***	-0.221***	-0.250***
	(0.060)	(0.060)	(0.060)	(0.061)	(0.060)
White	-0.142**	-0.154**	-0.155**	-0.101	-0.172***
	(0.061)	(0.061)	(0.061)	(0.062)	(0.062)
College Graduate	-0.152**	-0.177***	-0.182***	-0.118*	-0.170***
	(0.060)	(0.061)	(0.061)	(0.062)	(0.062)
Single	0.200***	0.256***	0.256***	0.254***	0.219***
	(0.064)	(0.067)	(0.067)	(0.067)	(0.067)
Employed	0.035	0.017	0.016	0.005	0.039
	(0.066)	(0.067)	(0.067)	(0.068)	(0.067)
Income > U.S. Median	-0.674***	-0.685***	-0.688***	-0.648***	-0.633***
	(0.067)	(0.067)	(0.067)	(0.068)	(0.068)
Reached Adulthood after		-0.221***	-0.231***	-0.266***	-0.250***
Recession		(0.082)	(0.084)	(0.084)	(0.084)
Financial Education through			0.013	0.026	0.055
Schooling			(0.067)	(0.067)	(0.067)
Financial Education through			0.054	0.046	0.104*
Parents			(0.060)	(0.061)	(0.061)
High Objective Financial				-0.441***	
Literacy (Score > 3)				(0.062)	
High Subjective Financial					-0.457***
Literacy (Score > 4)					(0.072)
Pseudo R^2	0.038	0.039	0.039	0.046	0.045
N	7,036	7,036	7,036	7,036	7,036

*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$

To start, the results in Table 4 tell an interesting story about those who reached adulthood after the Great Recession. Even though young adults are more likely to be in debt, they are less likely to be concerned about their student loans. Those with loans in older generations are 25% more likely to be worried about their debt's impact on their finances. Model 2 may also indicate that the 18-24-year-olds surveyed are better able to manage their student loans because they appear to be less concerned about them.

Models 4 and 5 in Table 4 also suggest that having a high level of financial literacy is helpful to alleviate the stress around having student loan debt. The individuals who did not score well on the objective measures of financial literacy were 55% more likely to show concerns about their debt situation. Those who said they did not feel confident about their financial knowledge had 58% greater odds of being worried about their student loans. Given that objective and subjective literacy have a stronger effect on whether a person shows concern than age does, this may also support the claim that Millennials are not profoundly impacted by their experiences during the Great Recession.

Appendices A and B present additional tables which model the relationship between student loans, age, and financial literacy. Appendix A shows the effects of the same independent variables in Tables 3 and 4 on whether an individual has a plan to repay their student loans. According to the second model in Appendix A, 18-24-year-olds have 70% greater odds to have developed a plan to address their student loan debt compared to older groups. In terms of financial literacy, the results are conflicting. Model 4 in Appendix A indicates that higher levels of objective financial literacy are associated with a lower likelihood of taking specific actions to get out of debt. Low objective financial literacy scores were linked to a 32% greater chance of developing a student loan debt plan. Alternatively, those who were confident about their level of financial literacy demonstrate a higher probability of having an action plan. The odds that these individuals know what they need to do to become debt-free was 49% higher than those who were insecure about the extent of their financial knowledge. Considering the findings in Table 4, these results are interesting. If age indeed has a greater effect on a person's decision to be more responsible for their student loans, then it could mean that the poor financial

choices made by others during the most recent economic collapse made some impression on the Millennial generation.

Analysis on student loan late payments in Appendix B provides additional insight into the behaviors of young adults and the financially literate. The second multivariate model in Appendix B shows that someone who became an adult after the Recession has a lower likelihood of not making a loan payment on time. The chance that a person who belongs to an older generation has ever made a late payment on their student loan is 81% greater than it is for the 18-24-year-olds surveyed. Further, the effects of financial literacy scores demonstrated more consistency in the late-payment models than it did for the concern models in Appendix B. High objective and subjective financial literacy suggest a statistically significant lower probability of making late payments on a student loan. Those with poor objective scores had 90% greater odds of not staying current on their loan and poor subjective scores increased the likelihood of missing a payment by 26%. As such, objective knowledge matters more than financial confidence when it comes to responsibly managing educational debt.

Finally, Appendix C examines the trends in student loan debt among 18-24-year-olds between the 2012 and 2015 waves of the NFCS. As explained in the data and methods section, some of those in the youngest age group in the 2012 survey were adults prior to the financial collapse in 2008. Therefore, comparing the same age groups between the 2012 and 2015 survey should produce partial generational effects related to the tendency to acquire student loan debt. Model 1 in Appendix C illustrates that the 2015 survey group are more likely to have student loan debt than the same age group three years prior. Even though the association is statistically significant, the generational

effects are weak. The 2015 cohort has only 7% higher odds of taking out loans compared to the 2012 cohort.

5. Conclusion

Although young Millennials spent their formative years experiencing the effects of a severe economic downturn and their decision-making today is to some degree informed by the events of the Great Recession, it does not appear to have made an impact on their choice to take out student loans to finance their education. Nonetheless, the evidence shows that while student debt may be a fact of life in a world where educational costs are increasing exponentially, students and recent graduates are more responsible about their management of debt. These same individuals are less likely to miss a student loan payment and are more likely to have a plan to become debt free. This is promising news. For a growing contingent, the fear that student loan payments will interminably delay important financial milestones might indicate a potential negative impact to consumer spending. However, young people feel more confident about their ability to pay back their loans. Although student debt loads might delay the age when young Millennials eventually purchase their first home or achieve enough financial stability to start a family, young adults, compared to earlier generations, do not see student debt as a disqualifier.

What this means for those in school and those who have recently graduated is that navigating student loan debt may not be quite as problematic as some in the media in political arena have suggested. This could also signal that once Millennials are financially prepared to make other important financial decisions, they will be well equipped to

successfully accomplish goals such as homeownership and retirement. Additionally, a more financially responsible generation would be a welcome trend for entitlement programs which may become insolvent in the next several decades. However, as discussed at the outset of the paper, the fact remains that young people are accumulating more educational debt than previous generations. Further, wage growth has been stagnant and unemployment rates were highest among youth during the recessionary period in the late 2000s and early 2010s. It is safe to say, that the younger generations will struggle to tackle additional important financial decisions until their student loan debt is under control. The government may be able to help. Expanding federal assistance to borrowers will make rising educational costs an easier pill to swallow while also demonstrating a high degree of trust in young adults that they possess the skills to make responsible financial choices.

Notwithstanding the important findings in this paper, there are some limitations to the analysis for the reader to note. First, the FINRA data comes from the most recent wave of the NFCS survey in 2015. This means, at the time of this study, the data is nearly three years old. Much has taken place in the intervening years; it would therefore be wise to review the data from the next survey wave to understand if young adults behave similarly to their equals from the 2015 NFCS. Moreover, the NFCS data comes from a single source. To strengthen the conclusions generated in this paper, it would be more practical to develop a unique survey instrument to administer more probing questions about student loan debt. Lastly, the pseudo R-squared measures in most of the multivariate models indicate that there is significant variation that is unexplained.

Another benefit of designing a custom survey would be to gather additional data on potential explanatory variables which are missing from the FINRA datasets.

As discussed at the outset, student loans represent a large proportion of the total amount of outstanding consumer debt and represent one of the first major financial decisions for many adults. Areas for additional research include examining the young Millennials' attitudes and behaviors related to other types of consumer debt like credit cards, car loans, and payday loans. It would be interesting to understand if a young adult's responsible behavior is limited to student loans or if they approach other financial products similarly. Longitudinal survey data would also provide insight into how attitude and behaviors change over time. An example of a compelling research question using longitudinal data might involve the association between the Millennial generation's financial literacy and the amount of time needed to pay off their student loans. This would provide a fuller understanding whether those who grew up during the Great Recession are better prepared to manage their personal finances.

References

Bell, David NF, and David G. Blanchflower. "Young people and the Great Recession." *Oxford Review of Economic Policy* 27, no. 2 (2011): 241-267.

Bernheim, B. D., Daniel M. Garrett, and Dean M. Maki. 2001. "Education and Saving: The Long-Term Effects of High School Financial Curriculum Mandates." *Journal of Public Economics* 80 (3): 435-465.

Bruin, J. 2006. "How do I interpret odds ratios in logistic regression?" *UCLA: Statistical Consulting Group*. https://stats.idre.ucla.edu/stata/faq/how-do-i-interpret-odds-ratios-in-logistic-regression/.

Chen, Haiyang and Ronald P. Volpe. 1998. "An Analysis of Personal Financial Literacy among College Students." *Financial Services Review* 7 (2): 107-128.

Danes, Sharon M., Catherine Huddleston-Casas, and Laurie Boyce. 1999. "Financial Planning Curriculum for Teens: Impact Evaluation." *Journal of Financial Counseling and Planning* 10 (1): 26-39.

Federal Reserve Bank of New York. 2018. *Quarterly Report on Household Debt and Credit, 2018 : Q3*. https://www.newyorkfed.org/medialibrary/interactives/householdcredit/data/pdf/HHDC_2018Q3.pdf.

Financial Industry Regulatory Authority. 2016. *Financial Capability in the United States 2016*. http://www.usfinancialcapability.org/downloads/NFCS_2015_Report_Natl_Findings.pdf.

Huston, Sandra J. 2012. "Financial Literacy and the Cost of Borrowing." *International Journal of Consumer Studies* 36 (5): 566-572.

Lusardi, Anna-Maria, Olivia S. Mitchell, and Vilsa Curto. 2010. "Financial Literacy among the Young." *Journal of Consumer Affairs* 44 (2): 358-380.

Lusardi, Annamaria and Peter Tufano. 2015. "Debt Literacy, Financial Experiences, and Overindebtedness." *Journal of Pension Economics and Finance* 14 (4): 332-368.

Mandell, Lewis. 2006. "Financial Literacy: If it's so Important, Why Isn't it Improving?" *Networks Financial Institute Policy Brief* 2006-PB-08: 1-10.

Mottola, Gary R. and Christine N. Kieffer. 2017. "Understanding and using Data from the National Financial Capability Study." *Family and Consumer Sciences Research Journal* 46 (1): 31-39.

Peng, Tzu-Chin Martina, Suzanne Bartholomae, Jonathan J. Fox, and Garrett Cravener. 2007. "The Impact of Personal Finance Education Delivered in High School and College Courses." *Journal of Family & Economic Issues* 28 (2): 265-284.

Reed, Matthew and Debbie Cochrane. 2012. "Student Debt and the Class of 2011." *Project on Student Debt*. https://ticas.org/sites/default/files/pub_files/classof2011.pdf.

Robb, Cliff A. and Deanna L. Sharpe. 2009. "Effect of Personal Financial Knowledge on College Students' Credit Card Behavior." *Journal of Financial Counseling and Planning* 20 (1): 25-43.

Stock, James H. and Mark W. Watson. 2007. *Introduction to Econometrics*. Addison-Wesley Series in Economics. Boston: Pearson/Addison Wesley.

U.S. Bureau of Labor Statistics, "Civilian Unemployment Rate [UNRATE]," last modified December 7, 2018; https://fred.stlouisfed.org/series/UNRATE.

Xiao, Jing Jian, Sun Young Ahn, Joyce Serido, and Soyeon Shim. 2014. "Earlier Financial Literacy and Later Financial Behaviour of College Students." *International Journal of Consumer Studies* 38 (6): 593-601.

Appendices

Appendix A

Multivariate Logit Models: Marginal Effects of Association with Having a Student Loan Debt Plan

	Model 1	Model 2	Model 3	Model 4	Model 5
Male	0.295***	0.293***	0.238***	0.273***	0.210***
	(0.058)	(0.059)	(0.059)	(0.060)	(0.060)
White	-0.299***	-0.275***	-0.296***	-0.266***	-0.284***
	(0.059)	(0.060)	(0.061)	(0.061)	(0.061)
College Graduate	0.071	0.132**	0.041	0.083	0.029
	(0.059)	(0.060)	(0.062)	(0.063)	(0.062)
Single	-0.024	-0.160**	-0.159**	-0.163**	-0.127*
	(0.063)	(0.066)	(0.068)	(0.068)	(0.068)
Employed	0.208***	0.257***	0.260***	0.252***	0.242***
	(0.066)	(0.067)	(0.068)	(0.068)	(0.068)
Income > U.S. Median	0.012	0.036	-0.008	0.021	-0.032
	(0.066)	(0.067)	(0.068)	(0.068)	(0.068)
Reached Adulthood after		0.529***	0.383***	0.367***	0.402***
Recession		(0.079)	(0.081)	(0.081)	(0.081)
Financial Education through			0.389***	0.397***	0.352***
Schooling			(0.065)	(0.066)	(0.066)
Financial Education through			0.787***	0.179***	0.748***
Parents			(0.059)	(0.059)	(0.059)
High Objective Financial				-0.278***	
Literacy (Score > 3)				(0.063)	
High Subjective Financial					0.402***
Literacy (Score > 4)					(0.073)
Pseudo R^2	0.010	0.016	0.049	0.052	0.054
N	7,515	7,515	7,515	7,515	7,515

*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$

Appendix B

Multivariate Logit Models: Marginal Effects of Association with Making a Late Student Loan Debt Payment

	Model 1	Model 2	Model 3	Model 4	Model 5
Male	0.061	0.068	0.066	0.147*	0.078
	(0.076)	(0.075)	(0.076)	(0.078)	(0.076)
White	-0.425***	-0.459***	-0.453***	-0.393***	-0.465***
	(0.077)	(0.077)	(0.078)	(0.079)	(0.078)
College Graduate	-0.558***	-0.616***	-0.622***	-0.530***	-0.615***
	(0.078)	(0.077)	(0.077)	(0.079)	(0.078)
Single	-0.046	0.065	0.066	0.051	-0.049
	(0.082)	(0.084)	(0.084)	(0.086)	(0.088)
Employed	0.071	0.046	0.049	0.037	0.060
	(0.088)	(0.088)	(0.088)	(0.089)	(0.088)
Income > U.S. Median	-0.824***	-0.862***	-0.864***	-0.812***	-0.851***
	(0.085)	(0.085)	(0.085)	(0.086)	(0.085)
Reached Adulthood after		-0.591***	-0.597***	-0.663***	-0.603***
Recession		(0.119)	(0.120)	(0.122)	(0.121)
Financial Education through			0.136	0.142*	0.156*
Schooling			(0.084)	(0.085)	(0.085)
Financial Education through			-0.064	-0.087	-0.040
Parents			(0.076)	(0.077)	(0.077)
High Objective Financial				-0.643***	
Literacy (Score > 3)				(0.080)	
High Subjective Financial					-0.232**
Literacy (Score > 4)					(0.092)
Pseudo R^2	0.059	0.066	0.066	0.081	0.068
N	4,662	4,662	4,662	4,662	4,662

*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$

Appendix C

Logit Models: Marginal Effects of Survey Year

	Model 1 Has Student Loan Debt	Model 2 Is Concerned about Student Loan Debt
Survey Year: 2015	0.070***	-0.067*
	(0.022)	(0.035)
Pseudo R^2	0.002	0.002
N	5,631	5,631

*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$

Curriculum Vita

Brendan Griffiths is a master's degree candidate in the Johns Hopkins University Krieger School of Arts and Sciences Government Analytics program. He is a native of Lansdale, PA and holds a Bachelor of Science in Finance from Georgetown University where he graduated in 2012. Mr. Griffiths currently lives in Washington, DC and has worked in the United States Department of the Treasury for over six years. He currently supports data analysis and reporting activities in the Treasury Auctions program which is responsible for selling marketable securities used to fund the federal government's operations.